INFLUENCE OF NATIONAL ACCELERATED AGRICULTURAL INPUTS ACCESS PROGRAMME ON MAIZE PRODUCTION IN NYAMARAMBE DIVISION, KISII COUNTY, KENYA

BY

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2012

DECLARATION

I hereby declare that this research project report is my original work and has never been presented for the award of a degree in this university or any other university.

Sign…….. Date: ……

KIPNG'ENO ROBERT BETT

L50/61467/2011

This research project report has been submitted for examination with my approval as the University Supervisor.

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DEDICATION

This research project report is dedicated to my parents, Geoffrey Rotich and Justine Rotich for their committed effort in ensuring that I get a decent education.

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LIST OF ABBREVIATIONS AND ACRONYMNS

NAAIAP - National Accelerated Agricultural Inputs Access Programme

NALEP -National Agriculture and Livestock Extension Program

SRA -Strategy for Revitalizing Agriculture

FY - Financial Year.

MOA - Ministry of Agriculture.

NGO - Non-Governmental Organization.

AEZ -Agro-ecological Zone

ASPS -Agricultural Sector Program Support

CDF -Constituency Development Fund

GoK -Government of Kenya

HYV -High Yielding Variety

IFDC -International Fertilizer Development Center

KNBS -Kenya National Bureau of Statistics

CATALIST -Catalyze Accelerated Agricultural Intensification for Social and Environmental Stability

GDP -Gross Domestic product

ABSTRACT

This study was on the influence of national accelerated agricultural inputs access program (NAAIAP) on maize production in Nyamarambe division, KisiiCounty, Kenya. The study was guided by the following objectives; To determine how provision of free farm inputs influence maize production in Nyamarambe division, Kisii county, Kenya, to establish to what extent farmer group trainings influence maize production in Nyamarambe division, Kisii county, Kenya, to examine how farm follow up visits influences maize production in Nyamarambe division, Kisii county, Kenya and to assess how holding of farmer field days influences maize production in Nyamarambe division, Kisii county, Kenya. The research questions werecentered on the four objectives which guided this study. Literature review on the Concept of national accelerated agricultural inputs access program (NAAIAP) provision of free farm inputs, Farmer group training, farm follow up visits, and holding of farmer's field days. This study was based on subsidy theory; this theory on providing farm inputs and capacity building support to farmer in order to increase production and the chapter also covers theoretical Framework and Conceptual Framework.This research used a descriptive research design as it seeks to analyze the relationship between the variables that influence maize production in NAAIAP program.The criterion for the selection of the study population was based on the NAAIAP program beneficiaries who received program services covering distribution of input grants and capacity building by the government of Kenya to resource poor farmers in the division during the 2009/2010 and 2010/2011 financial year. A total of one thousand two hundred farmers received program services and thus this was the study population. A pre-test of research instruments weredone in the Nyakembene location to twenty participants to determine the reliability and validity of the data collection instruments. Data was collected using one type of questionnairewhich wasadministered on the sampled beneficiaries and the resulting data collected was coded and entered into frequency tables. Data analysis presentation and analysis outputs are descriptive statistics in form of frequency tables, percentages and mean. Inferential statistics used were also usedcorrelation analysis aided the researcher on determining the relationship between variables. This research established that the NAAIAP program intervention led to increased maize production in Nyamarambe division.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Agriculture is one the oldest economic activity in the world, to date it is still a major contributor to the world's economic activity. Agriculture remains the economic growth engine in much of Africa, along with numerous countries in Latin America, Asia and the central Asia which were previously part of the former Soviet Union (IFDC 2009-2010, annual report).Worldwide production of maize is 785 million tons, with the largest producer, the United States, producing 42%. Africa produces 6.5% and the largest African producer is Nigeria with nearly 8 million tons, followed by South Africa. Africa imports 28% of the required maize from countries outside the continent most maize production in Africa is rain fed. Irregular rainfall can trigger famines during occasional droughts (Food and Agriculture organization, 2009)in2000; US farmers planted over 79 million acres of maize(Mayrand, 2003).

In Africa, since the inception of the Catalyze Accelerated Agricultural Intensification for Social and Environmental Stability (CATALIST) project in Burundi, the Democratic Republic of Congo and Rwanda, over 50% of farmers exposed to participatory tests have adopted one or more agricultural technologies (IFDC 2009-2010, annual report).Emerging from the worst harvest in a decade, the Government of Malawi implemented one of the most ambitious and successful assaults on hunger in the history of the African continent. Through a national maize input subsidy program, coinciding with better rainfall conditions, maize production doubled in 2006 and almost tripled in 2007. From a 43% national food deficit in 2005, Malawi achieved a 53% surplus in 2007, some of which was exported to neighboring countries(President BinguwaMutharika,2008).

In Kenya there are approximately 3.5 million smallholder farmers owning an average of 2.5 acres of land. This smallholder sub sector covers 60% of the farm area and accounts for an estimated 75% of agricultural production and a total of 85% of total agricultural employment (National accelerated agricultural inputs access program, resource mobilization manual 2012). Despite the contribution, the agriculture sector has continued to perform poorly due to significant challenges (Ministry of agriculture annual report, 2004) (Kenya rural poverty report 2011). The government of Kenya in an effort to address food security challenges through the development of maize value chain aimed at improving maize production designed the NAAIAP program.National Accelerated Agricultural Inputs Access Program (NAAIAP) seeks to address the problem of food security and poverty by the very resource-poor farmers in this manner. (National Accelerated Agricultural Inputs Access Program Design and Implementation Framework, 2009). NAAIAP targets an outreach of approximately 2.5 million smallholder farmers throughout the country. The group approach will be used as an entry point for service delivery including capacity building through farmer training, field days and demonstrations to reach more farmers.(National Accelerated Agricultural Inputs Access Program Design and Implementation Framework, 2009)

The land allocated to maize production in Nyamarambe division is approximately 2000 hacters with an estimated production of 75,000 bags each weighing 90kgs (Ministry of agriculture Nyamarambe, 2011) .The is a record decline in maize production in Nyamarambe division overtime and this is caused by decline in soil fertility, increasing agricultural extension worker to farmer ratio, continued subdivision of land, infestation of pests and diseases and notable the striga weed and low funding to agricultural extension by the government (Ministry of agriculture Nyamarambe, 2011)

1.2 Statement of the Problem

Sub-Saharan Africa faces an enormous Food Security Challenge never experienced in human history before, with over 210 million lacking access to food. Researchers and development workers in Africa reckon that food insecurity is a complex problem that can only be tackled properly through a combination of inter-disciplinary, participatory on-farm research, effective extension systems and access to markets.Maize yield variability is extremely high in sub-Saharan Africa. Even among developing countries that have approximately the same mean yields, the variability of yields is nearly always higher in countries of Sub-Saharan Africa (Byerlee and Heisey, 1997) In Kenya drop in maize production often results into expensive imports that push the prices of food high resulting in higher inflation.The overall national maize output is expected to be lower by up to 25 per cent according to Kenya's (Ministry of Agriculture, 2012) although the use of improved maize seed can be a catalyst for increasing farmers use of other inputs, and especially fertilizer, most farmers do not adopt the additional production practices needed to sustain yield improvement. Smallholder farms, averaging less than two hectares in Kenya are responsible for more than 75% of agricultural production in Kenya (Spring, 2000; Shibanda&Seru, 2002).NAAIAP is one of the programs being implemented by the ministry of agriculture in Kenya and aims at developing the maize value chain through a number of interventions to enhance food security. There has been increased need to ascertain whether the various interventions being implemented by the program really results in increased maize production. NAAIAP was introduced in Nyamarambe division in 2009/2010 financial year where six hundred farmers benefited and in 2010/2011 financial year another 600 farmers benefited from the program. Based on the above NAAIAP interventions, the researcher will therefore like to assess the influence of national accelerated agricultural inputs access program on maize production in Nyamarambe division, Kisii County, Kenya.

1.3 Purpose of the Study

The purpose of this study was to determine the influence of national accelerated agricultural inputs access program on maize productionin Nyamarambe division, KisiiCounty, Kenya.

1.4 Objectives of the Study

This study were be guided by the following objectives,

1. To determine to what extent doesprovision of free farm inputs influencemaize production in Nyamarambe division, KisiiCounty, Kenya.
2. To establish the extent to which farmer grouptrainingsinfluencemaize production in Nyamarambe division, KisiiCounty, Kenya.
3. To examine to what extent doesfarm follow up visitsinfluence maize production in Nyamarambe division, KisiiCounty, Kenya.
4. To assess to what extent doesholding of farmer field days influence maize production in Nyamarambe division,KisiiCounty, Kenya.

1.5 Research Questions

1. To what extent does provision of free farm inputs influence maize production in Nyamarambe division, Kisii County, Kenya?
2. Howdoes farmer group trainings influence maize production in Nyamarambe division, Kisii County, Kenya?
3. How does farm follow up visits influence maize production in Nyamarambe division, Kisii County, Kenya?
4. How doesholding of farmer field days influence maize production in Nyamarambe

1.6Significance of the Study

This study may help the staff implementing the project in Nyamarambedivision to know the influence of NAAIAP onmaize production and subsequently reinforce what is working well and devise copping strategies on those activities not working well. The study will also inform the agricultural stakeholders on the output of various intervention measures on maize production. This study may also assist the government in the evaluation of results of NAAIAP.

1.7Limitation of the Study

During field data collection heavy down pour were experienced especially in the afternoon period and the researcher overcame this by starting the data collection exercise early in the morning. There was also high expectation from the respondents as some of them thought that the questions being asked would determine if more support would be given to them thus tempted to give untruthful information. The researcher overcame this by leveling the expectation by explicitly explaining that these were meant purely for research purpose and not aimed at determining if the need support or not. The researcher also informed them that confidentiality will be ensured.

1.8Delimitation of the Study

This study weredelimited to the one thousand two hundred resource poor farmers who received NAAIAP Kilimo Plus input subsidies in Nyamarambe division of Gucha south district, Kisii County, Kenya during the 2009/2010 and 2010/2011 financial year.

1.9The scope of the study

The study were be done in Nyamarambe division, KisiiCounty, Kenya

1.10Assumptions of the Study

The study was built on the premise that there will be respondents to interview, that the weather will be favorable and that there will be no extreme political tensions that will hinder the study.

1.11Definition of Significant Terms as used in the Study

National Accelerated Agricultural Inputs Access Program (NAAIAP)-This is a government of Kenya program implemented by the ministry of agriculture aimed at enhancing maize production. The program apart from providing farmers with free farm inputs the program also conduct farmer trainings, farm follow up visits and holds field days. All aimed at increasing maize production.

Farm inputs- this refers to a combination of seeds, planting fertilizer and top dressing fertilizer that is used for maize production.

Farmer trainings- this refers to training of farmers on various topics that concern maize production.

Farm follow up visits-this are the on farm support visits made by agricultural extension staff to advice farmers on how to improve maize production.

Field days-This are on farm exhibition of best agronomic practices so that farmers can learn from the exhibited demo plots.

Program–this refers to a collection of related projects

Implementation–refers to organized effort that the project team put so as to achieve Program objectives.

Kilimo plus pack-this refers to a farm input starter kit comprising of fifty kilograms of basal fertilizer, fifty kilograms of top dressing fertilizer and ten kilograms of seed. This pack is subsidized by the government and given to farmers for free and is adequate to plant one acre of maize crop

KilimoBiashara –farming for business purposes

Maize production-this refers to theyield per bag.

ToT- trainer of trainees

1.12Organization of the Study

Chapter one comprises of background information, statement of the problem, research objectives, research hypothesis, significance of the study, limitation of the study, delimitation of the study, scope of the study, assumption of the study, definition of significant terms used in the study.Chapter two contains the literature review and chapter three has the research methodology, chapter four data analysis, presentation and interpretation chapter five is on summary of findings, conclusions and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviewed literature on the Concept of national accelerated agricultural inputs access Program (NAAIAP), Provision of free farm inputs to farmers, Farmer trainings, farm follow up visits and holding of fielddays by NAAIAP. This chapter also reviewed literature on the subsidy theory and illustrate the conceptual framework.

2.2 Concept of National Accelerated Agricultural Inputs Access Program (NAAIAP)

The National Accelerated Agricultural Inputs Access Program (NAAIAP) seeks to address the problem of food security and poverty by the very resource-poor farmers in this manner. The primary objective of NAAIAP is to improve input access and affordability of the key inputsfor the millions of small holder farmers, particularly those living below the absolute poverty line, so that they can get out of the vicious cycle of poverty and participate in agriculture as a business enterprise inputs (National Accelerated Agricultural Inputs Access Program Design and Implementation Framework,2009).

The program aims at increasing productivity at farm level through Kilimo Plus starter kits (Inputs Grant) and this approach targets the very resource poor farmers who own less than 2.5 acres of land. This category of farmers will be provided with basic inputs to cover at least 1 acre of land of crop of their choice. The Kilimo Plus pack may comprise of seed and fertilizer but can also be other inputs of the farmer's choice. The objective is to enhance food security/ availability at household level and generate income from surplus sales. Farmers will receive a grant of KSh 7,000 each or the inputs. The grant will be administered through use of vouchers issued under authority of the district stakeholder forum, with guarantee of the respective groups. The voucher will enable farmers to get inputs from accredited stockiest

trained for the purpose. Stockiest will redeem the vouchers from contracted financial services provider. A stakeholder forum will be held at district level to vet and authorize grants to deserving groups and approve vouchers. After two seasons these farmers are expected to graduate to the next category and participate in KilimoBiashara. (National Accelerated Agricultural Inputs Access Program, Program Design and guidelines, 2008)

NAAIAP targets an outreach of approximately 2.5 million smallholder maize farmers throughout the country. The group approach will be used as an entry point for service delivery including capacity building through farmer training field days and demostrations to reach more farmers. The groups will also be expected to ensure that inputs provided through NAAIAP on grant basis are utilized and that part of the produce is channeled through the groups' cereal banks/Receipt Warehousing Scheme that will be used to finance the groups subsequent inputs (National Accelerated Agricultural Inputs Access Program Design and Implementation Framework 2009)

Worldwide production of maize is 785 million tons, with the largest producer, the United States, producing 42%. Africa produces 6.5% and the largest African producer is Nigeria with nearly 8 million tons, followed by South Africa. Africa imports 28% of the required maize from countries outside the continent most maize production in Africa is rain fed. Irregular rainfall can trigger famines during occasional droughts (Food and Agriculture organization, 2009)

The potential for expanding maize production in Sub-Saharan Africa is huge. Even after excluding protected and forested areas, an estimated 88 M ha of land that is not yet planted to maize is suited to the crop. Worldwide, this amount is equivalent to four times the area now planted to maize and over half of the additional land area that is suitable for maize (Deininger and Byerlee, 2011).There is a marked increase in maize productivity in Kenya and the key

drivers of this change are; liberalization of the seed industry leading to increased adoption of high-yielding varieties, increase adoption of fertilizer use, reduced distances to agricultural input stockists, and greater density of agricultural input stockists in smallholder farming areas, leading to reduced transaction costs of accessing these inputs. (Tegemeo Institute, 2008) .Although the use of improved maize seed can be a catalyst for increasing farmers use of other inputs, and especially fertilizer, such broad-based change has only occurred in some parts of Sub-Saharan Africa,drop in maize production often results into expensive imports that push the prices of food high resulting in higher inflation.The overall national maize output is expected to be lower by up to 25 per cent according to Kenya's (Ministry of Agriculture, 2012) because of relatively poor availability of inputs during planting, maize lethal necrosis disease (MLND) outbreaks, effects of flash floods in April and May, and the possibility of heightened pre- and post-harvest losses due to the enhanced short rains. "The maize harvest prospects are generally good in the main growing areas where output is expected to be near normal. The long rains maize production that is due for harvest accounts for about 85 percent of annual production at the national level. According to the (Ministry of Agriculture,2012) an estimated 1.3 million hectares has been put to maize production during the 2012 long rains season. Although planting delayed by a month due to the late onset of the rains,the crop condition is generally good in the main growing areas of the Rift Valley, Nyanza, and Western Provinces, southeastern and coastal lowlands where the performance of the long rains maize crop is mixed, very poor in the marginal mixed farming zones and relatively better in the high altitude mixed farming zones.

According to (Locker and Gordon, 2009) effective program implementation requires a number of factors and considerations to be adhered to. These include, Firstly, having a clear project plan in place. The plan should have a time table for work to be done and commensurate resources to carry out planned activities. It should be noted that the project

management plan is an iterative process which requires judicious, quick reviews and updates as information becomes available throughout the life of the project. Secondly, the top project management must have or recruit personnel based on the required level of competence and experience, with clearly spelt out job descriptions and terms of employment. These should include responsibilities and sufficient authority. Team building and development of personnel should be enhanced through appropriate training and motivation.

Agriculture is one of the economic sectors in which subsidies are most extensively used. Taken together, subsidies in the agricultural, fisheries, transportation and energy sectors account for 81 percent of world subsidies and affect 66 percent of world trade. They therefore, have profound implications on production and trade in the agricultural sector (Mayrand, 2003). In America, the US Farm Bill provides for agricultural subsidies which favour large industrial agriculture (Mayrand, 2003).

An evaluation study done in the Malawi`s subsidy model by Doward, Chirwa, Slater, Jayne, Boughton, et al,2008) identified a number of operational challenges that needed to be addressed by the Government in redesigning the program. These included: delays in program design and implementation leading to delayed delivery of inputs in some areas; cumbersome coupon processing and redemption systems; the need to improve program information sharing with the intended beneficiaries and general public ; and shortages of fertilizers and mismatch of coupons and fertilizer types in some areas. The absence of private agro-dealers in remote rural areas and limited human and financial capacity of government agencies to meet the operational demands of the program added the long list of challenges that rose from the evaluation study

2.3 Provision of Free Farm Inputs to Farmers

In America, the US Farm Bill provides for agricultural subsidies which favor large industrial agriculture (Mayrand, 2003). Agricultural subsidies in the European Union (EU) are cited as major factors in the decline of the world price of sugar. Rich nations of the Organization of Economic Cooperation and Development spent about $360 billion on agricultural support during 2001, for a range of commodities. During the 2001/02 season, the US spent about $3.9 billion on subsidies and other supports to its 25,000 cotton farmers. These subsidies have encouraged overproduction in the US, resulting in the flooding of the world market by cotton sold at prices less than it costs to produce. This has depressed prices to levels at which competitors struggle to survive. In a study on the impact of US cotton subsidies on Africa, Cultivating Poverty, Oxfam- a United Kingdom NGO-, argued that production and export subsidies in the US have devastated not only small communities in Africa, but entire regions (UN, 2003).

In Asia, the Green Revolution began in the 1960s with the development of fertilizer responsive, high yielding varieties of rice and wheat (Evenson&Golin, 2003). Global average yields of these staple crops more than doubled over this period with greatest impact noted in regions with irrigation or more reliable rainfall. Improved access to fertilizer through state-supported subsidies, rural credit, and improved infrastructure contributed to strong productivity growth in both crops. Asian governments also supported the uptake of new technology through research and extension, and intervened in the market through price support (Djurfeldt&Jirstrom, 2005; World Bank, 2007).

A study by Costigilio& Segal, 2006) noted that farmers in Sub-Saharan Africa use only 9Kg of fertilizer per hectare on average, compared with 142Kg in South- East Asia which is less than a tenth of the world average of 1000 Kg.The recent hikes in food prices have created

economic and social turmoil in many African countries. But in Malawi, fertilizer and seed subsidies have enabled small-scale farmers to improve maize productivity and achieve food security Malawi has led the way in Africa in demonstrating the opportunities and challenges of implementing a national input subsidy program. With the impetus of recent high food prices and a softening of donor opposition to subsidies, several of Malawi's neighbors (including Kenya, Rwanda, and Tanzania) are now studying, adapting, and building on this experience to design and implement similar programs for improving agricultural productivity. Malawi's experience will continue to provide valuable lessons for achieving and sustaining Africa's Green Revolution. (Denning G et al, 2009) While inorganic fertilizer may increase yields in SSA, subsidizing fertilizer purchasesalso strains limited government and donor budgets. For example, during 2005 and 2006, the government of Malawi distributed vouchers to farmers for 131,803 metric tons of fertilizer at a price substantially below commercial market price. The program cost U.S. $60.5 million per annum (Dorward et al. 2008)

Agricultural inputs, primarily seed, fertilizer and agrochemicals, have an enormous potential to leverage the efforts of hard-working farmers. Used appropriately, they can mean the difference between a good harvest and starvation (Negeri and Adisu, 2001). Experience has shown in other countries, such as Kenya, Zimbabwe and Malawi that small scale, resource poor farmers can double or triple the productivity of maize by using quality hybrid seeds, improved management practices, use of modern farming technologies and provision of credit (Negeri, 2001; Friis-Hansen, 1994) However, It isclear that the break even yield level for a farmer who pays discounted prices for subsidized fertilizer is lower than for a farmer who pays commercial prices. Therefore the farmer who uses subsidized fertilizer may have incentive to over-apply fertilizer and under-apply other inputs such as seed, irrigation and labor thus receiving a lower marginal product from (Morriset al, 2007). Conversely it would seem that a farmer has incentives to use a productive asset asefficiently as possible regardless

of how much he paid for it. In this sense one might expect farmers who received subsidized fertilizer obtain similar response rates to farmers who purchase commercial fertilizer.

It has really taken people out of hunger, but it's not a lasting solution. Recent hikes in food prices have created economic and social turmoil in many African countries. But in Malawi, fertilizer and seed subsidies have enabled small-scale farmers to improve maize productivity and achieve food security (Sibale, FAO consultant in Malawi, 2009)Further, the seeds must be sold at competitive and affordable prices while ensuring their wide distribution, including alternative high yielding, improved and established landraces. These will increase the farmers` options to harmonize their seed choice with their limited resources and changing circumstances; ensuring household food security. Input subsidies encourage the adoption of certain technology and higher use level of inputs (Saeed, 2007). The biggest challenge facing development workers in the continent is how to increase food production without compromising environmental quality, given the declining food prices and quickly disappearing markets (E. Mukhwana, 2003).

Many African countries, including Kenya, Tanzania, Malawi, Zimbabwe and Zambia pursued largescale “universal” subsidy programs from the 1960’s up through the 1980’s (Dorward, 2009). These programs were characterized by a government-controlled input and output marketing system, in which farmers were supplied with agricultural inputs at controlled and subsidized prices, and often on heavily subsidized credit. The experiences under these programs were mixed. The programs succeeded in raising input use by farmers and increasing agricultural productivity in many cases. However, they were extremely expensive, most subsidies tended to benefit relatively well-off and better connected farmers, and the advances in agricultural productivity were dependent on continued government support. Further, the fertilizer subsidy programs were prone to inefficiencies arising from high

administrative costs, government monopolies and political manipulation (Banful, 2010b). As the subsidy programs were dismantled and input markets liberalized as a part of the structural adjustment process in the 1980's and 1990's, input use and agricultural productivity declined (Crawfordet al, 2006). After a period of liberalized input markets by the end of the last century, new subsidy programs began to emerge in several African countries. The Malawian government pioneered the return to large scale subsidies in 1998, when it began distributing free fertilizer to farmers (Banful, 2010b). Other countries, such as Nigeria, Zambia, Tanzania, Kenya, Ghana soon followed Malawi's example. In 2006,Abuja, Nigeria, hosted the Africa Fertilizer Summit under the auspices of the African Union (AU), the New Partnership for African Development (NEPAD) and the Government of Nigeria (Yawson, 2010).

An important output of that summit was the Abuja Declaration on Fertilizer for African Green Revolution, in which AU member states set out to increase fertilizer intensity to an average of 50 kg/ha by 2015. One of the instruments in a five point action plan was to implement smart subsidy programs to improve access to fertilizers for small-holder farmers.

Smart subsidy programs are meant to address the shortcomings of the universal subsidies. To be "smart", subsidy programs should adhere to a number of design principles, which can be summarized under the following headlines (Minde et al, 2008; Tiba, 2009):

Targeting specific farmersSmart subsidies should be targeted specifically at farmers, who do not already apply agricultural inputs, as well as the poorest and most vulnerable households. This reduces the risks of displacing commercial (non-subsidized) input sales and promotes pro poor growth.

Market-based solution Smart subsidy programs should utilize and support the further development of existing private input supply networks, rather than supplant them with state controlled distribution systems. This enhances the efficiency of input delivery as well as Increases the likelihood that the program has a sustained impact after its termination.

Exit strategySmart subsidy programs should devise credible exit strategies to put a time Limit on the support. This is primarily to reduce the risks that the program becomes "hijacked" by political interests (Dorward, 2009) and to facilitate long term sustainability. If Stakeholders expect the support to continue indefinitely they are less likely to prepare for self-sustaineduse of inputs on market terms. Also, a firm exit strategy helps control the costs of the program.The three characteristics are largely complementary. If subsidies are well targeted, the greater demand for inputs is likely to encourage potential entrepreneurs to establish new businesses, which promotes the development of a competitive input market. However, if the subsidized inputs primarily displace commercial input sales, private dealers are hurt by the "unfair" state-supported competition and may choose to exit the market, thereby reducing competition.

Despite the potential benefits the costs of implementing large-scale fertilizer subsidy programs are high, and can increase substantially when fertilizer and fuel prices rise. For example, in 2008 Malawi spent roughly 70% of the Ministry of Agriculture's budget or just over 16% of the government's total budget subsidizing fertilizer and seed (Dorward and Chirwa 2011). In Zambia, 57% of total government spending on agriculture was devoted to fertilizer and maize subsidies in 2010, equivalent to 2% of the nation's gross domestic product (Nkonde et al., 2011; IMF, 2010).

Agriculture sector is the backbone of Kenya's economy and a means of livelihood for most of our population (Agriculture sector development strategy, 2010-2020). In an effort to stabilize farm input prices, the government has intervened by availing fertilizer at national cereals and produce board depots country wide (Daily Nation newspaper 7/03/2011).Most often categorized as a qualified success (Eicher 1995), the maize productivity gains achieved through smallholder adoption of improved seed and fertilizer during the 1980s were driven in part by the appropriateness of the technologies themselves and in part by state policies that

encouraged their use through supporting markets and prices. Although these policies successfully promoted maize production in many countries, they imposed massive costs on national treasuries and contributed to the fiscal crises that most African governments experienced during the 1980s and early 1990s (Jayne and Jones, 1997; Smith et al. 1997).

2.4 Farmer Group Trainings

Farmers' performance is directly linked to their human capital endowment, which encompasses both innate and learned skills (Anderson and Feder, 2004). The rationale for extension services, farmer education programs, and various forms of formal and informal training is the desire to enhance and expand farmers' human capital. Farmers also undertake initiatives to acquire knowledge from other source published media, radio, as well as from their own experiences and experimentation. A key source of information for farmers is other farmers, because it is readily available and its utilization does not impose high transaction costs (Feder and Slade, 1985; Rees et al., 2000).

Farmer field schools (FFSs) are a popular education and extension approach worldwide. Such schools use experiential learning and a group approach to facilitate farmers in making decisions, solving problems, and learning new techniques. A rather unique approach has been practiced in Taiwan, where a large share of extension work is done through farmers' associations (Lionberger& Chang, 1970). Organized at provincial, county, and township levels, membership totaled 90 per cent of Taiwanese farmers. Extension education is done by agents employed by the farmers' associations at the township level and financed largely by the farmers themselves. Unlike the small self-help groups discussed above, there are strong and institutionalized linkages with research and other services. The overall extension policy is defined by the government. On the other hand, the clientele is quite different: farms are highly modernized and extension advice is demand driven.Farmers` poor organizational capacity makes it impossible for them to bulk, store and market their produce and negotiate

favorable prices with traders. The consequence of this is that immediately after harvest, farmers receive poor farm gate prices for their produce. The farmers` urgent need for cash to pay for their immediate financial needs make them impatient to wait for several months for prices to improve, leaving them further vulnerable to opportunistic middlemen (Tinega, 2010)

Agricultural education, extension, and advisory services are a critical means of addressing rural poverty, because such institutions have a mandate to transfer technology, support learning, assist farmers in problem solving, and enable farmers to become more actively embedded in the agricultural knowledge and information system (Christoplos and Kidd 2000). Extension is responsible to almost one billion small-scale farmers worldwide. It is thus urgent to seek the best ways to support such farmers in terms of information, technology, advice, and empowerment. Finding an extension approach is a special challenge in the African context, as poverty is growing and productivity is declining on the continent. Twenty-four African countries have listed extension as one of the top agricultural priorities for a poverty reduction strategy (InterAcademy Council 2004).

One very popular extension and education program worldwide is the farmer field school (FFS) approach, now in place in at least 78 countries (Braun et al. 2006). Started in Indonesia in 1989, FFSs have expanded through many parts of Sub-Saharan Africa. Kenya alone is the site of more than 1,000 such schools with 30,000 farmer graduates Many donors, governments, and nongovernmental organizations (NGOs) enthusiastically promote FFSs in Sub-Saharan Africa today. As a result of their popularity, there is some discussion as to whether the FFS approach should be scaled up and out and incorporated into mainstream extension practices (Anandajayasekeram, Davis, and Workneh 2007).

As FFS implementation is being scaled up in Africa, there are growing concerns and interest among stakeholders and donors regarding the applicability, targeting, cost-effectiveness, and

impact of the approach. There have been relatively few efforts to document in a systematic manner the impact of FFSs, and therefore extension actors often find themselves with many questions about when, where, and how FFSs should be applied.

Although the FFS approach is a popular method, according to (Leeuwis, Röling, and Bruin ,1998) much of what is written on FFSs is found only in the grey literature and deals mainly with the methodology or cases of FFS approaches. Thus the long-term impacts of FFSs remain unclear. Some of the evidence on those impacts in peer-reviewed journal articles is conflicting. Thus, much is still unknown about the approach and the issues pertinent to extension, such as poverty reduction, sustainability, participation, and financing.

A group comprises of two or more persons who are interacting in such a way that each person influences and is influenced by each other person. Groups are characterized by interaction, shared values and beliefs, common goal, structure and ideology. Membership of groups influences lives because through these groups, participants become members of larger organizations, cultural institutions and societies as a whole. An example of such a group is a cooperative. Cooperative societies being groups are made up of members from other groups. All over the world cooperatives are instruments of social and economic transformation (Ofuoku, 2009). Although agricultural extension service is necessary to raise the awareness of farmers of existing and new technologies, it is not sufficient in itself to raise agricultural productivity due to many factors that influence productivity (Kibaara,2006). Voices for Structural Reform and Market liberalization advice farmers to form marketing associations to overcome the situation, but few models are available for adoption (Nyoro et al, 1999).NAAIAP targets an outreach of approximately 2.5 million smallholder farmers throughout the country. The group approach will be used as an entry point for service delivery including capacity building to reach more farmers. (National Accelerated Agricultural Inputs Access Program, Program Design and Implementation Framework 2009)

Forming a farmer group for marketing activities is useful to overcome certain farm level constraints such as transport, acquisition of facilities or inputs, accessing information on markets and provides an avenue for better organization and management capacity. In collective group marketing, members enjoy reliable financial agreements and payments, secure reliable orders, ensure flow of market information and communication, availability in quantity, time and place of inputs, reliable internal organization of the group and financial issues (Croll et al, 2000).

Shepherd, 2000) identified marketing to be farmers` frequent major problem. However, while famers are able to identify such problems as poor prices, lack of transport and high post-harvest losses, they are often poorly equipped to identify potential solutions. Successful marketing requires learning new skills, new techniques and new ways of obtaining information. Meinzen, 2007) noted that new marketing linkages between agribusiness, large retailers and farmers should gradually be developed. Such developments should include niche marketing, contract farming, group marketing and other forms of collective action.

There exists a general consensus that if properly designed and implemented, extension services improve agricultural productivity (Romani, 2003; Evenson and Mwabu, 1998). Agricultural extension services provide farmers with important information, such as patterns in crop and livestock prices, new and existing technologies, crop and livestock management, and marketing. Exposure to such information enhances farmers' ability to optimize use of the scarce resources at their disposal. Awareness of existing technologies generates effective demand by providing a critical signal to input distribution systems (Davidson et al, 2001). Extension systems and input distribution systems are, therefore, mutually reinforcing in their contribution to agricultural productivity (Muyanga et al, 2006).

Cooperatives have been an effective way for people to exert control over their economic livelihoods as they play an increasingly important role in facilitating job creation, economic growth and social development. To be effective and successful, a cooperative must continuously achieve two inter-related goals: enhance viability and improve ability to service its members; and remain an economically viable, innovative and competitive enterprise (Dogarawa, 2005).

The effectiveness of the diffusion process is of great practical importance in the design of farmer knowledge enhancement strategies, as it affects the cost effectiveness and financial sustainability of publicly funded farmer information services such as extension and adult education. If information diffuses extensively from farmer to farmer through informal communication, then a relatively small effort, focused on a nucleus of farmers trained or contacted regularly by knowledge agents, could achieve a large impact at a reasonable cost. If, however, the knowledge that is expected to be diffused is complex, or otherwise deals with technology that is costly, the diffusion process among farmers may be slow and limited. The number of farmers who will need to be trained directly will have to be large if a significant impact is to be achieved. This implies higher program costs,and a greater challenge to economic viability and financial sustainability. These are indeed matters of great concern, as financial issues have afflicted many agricultural knowledge systems in both developed and developing countries (Feder, 2001). Financial problems are derived, in part, from inherent incentive, bureaucratic, and political challenges that affect most public extension systems and that produce a mixed record of performance (Anderson and Feder,2004). Consequently, rural development agencies seek to introduce new modalities for farmers' education and extension systems. By contrast, another study of the early stages of diffusion shortly after the completion of a pilot FFS program in Kenya cited evidence of messages being conveyed from trainees to other members of their communities (Loevinsohn, 2000). Simpson and

Owens (2002) also found evidence of some diffusion in an evaluation of FFS experiences in Ghana and Mali, with frequent communication between trainees and other farmers regarding specific agricultural practices. However, diffusion regarding key training themes such as insect-plant-soil interactions was found to be extremely limited

For sustainability of NAAIAP cereal banks there is need for continuous training and research in production with direct relation to marketing. Issues to deal with crop production, business skills, record keeping, credit management, group organization, ownership and constitutional review of laws to enhance participation must be looked into whenever need arises. There is need for dependable access to farm inputs at affordable rates. Credit arrangements to acquire the same must be put in place (NAAIAP, 2009).

2.5Farm Follow Up Visits

The design of agricultural extension programs in developing countries has beenthe subject of heated debate. Guided by these debates, extension services have undergone several transformations in the past few decades (Byerlee,1994). The main transformation, until recently, was a shift from the transfer-of-technology approach to the Training-and-Visit, or T&V, system. Under T&V, the extension system was reoriented from a desk-bound bureaucracy with multiple economic and social objectives to a field-based cadre of agents who focused mainly on technology diffusion (Picciotto and Anderson, 1997). T&V extension agents would meet with a small group of "contact" farmers who were expected to disseminate information to the members of their respective communities and convey farmer's opinions back to the agents, thus creating a feedback mechanism absent in the prior system (Birkhaeuser, et al, 1991). For nearly three decades, international aid donors, such as the World Bank, promoted T&V as the most cost-efficient extension system.

Follow-up visits and the adoption of new technology in the form of hybrid maize seeds were found to have a significant relationship with contract farming compared with farm input

supply and frequency of extension visits. The study therefore recommends that extension organizations should consider the usefulness of follow-up visits after recommendation of new technology to farmers. These include the arrangement of follow-up visits to farmers after adoption for further education on the technologies and techniques recommended. Farmers should be given as much freedom as feasible in managing their enterprises, particularly with respect to choice of crop mix and off-farm activities. (Amim, 2010)More than 25 years after Chambers' seminal work ''Rural development: Putting the last first'' (Chambers, 1983), the popularity of participatory approaches in rural development and agricultural research shows no sign of abating. Notwithstanding the polarized debate on the value of participation in the 1990s, participatory approaches in international and national research centers have encountered both successes and failures (Probst,2002).Since the turn of the millennium it has become evident that the claim of ''the more participation, the better'' articulated by the forebears of participatory rural appraisal (PRA) and participatory technology development (PTD) in the 1980s and early 1990s would need to be replaced by a more grounded discussion of the specific potential and shortcomings of participatory and conventional methods in a particular research setting.

Approaches to agricultural extension in India and worldwide continue to evolve. Since the Green Revolution in the 1970s and 1980s and the acknowledged unsustainability of the training and visit (T&V) program (Anderson, Feder, and Ganguly 2006; Moore 1984), agricultural extension, with its focus on increasing production via technology transfer, has adopted decentralized, participatory, and demand-driven approaches in which accountability is geared toward the users (Birner et al. 2006; Birner and Anderson 2007; Davis 2008; Hall et al. 2000; Kokate et al. 2009; Sulaiman and Hall 2008; Swanson 2009). While the call for demand-driven agricultural extension has existed for several decades now, new modes of reaching out to farmers could have significant impact in India, as they might better reflect the

local information needs of farmers. The diverse nature of the Indian subcontinent, with its wide variety of agroclimatic regions and broad range of socioeconomic conditions in the rural population, calls for agricultural extension approaches that are context- and situation-specific. With more than 81 percent of Indian farmers cultivating an area of 2 hectares or less (India, Directorate of Economics and Statistics 2009; NSSO 2006), there is an increasing need for stronger intermediaries that can facilitate information access for diverse smallholder farmers. Further progress in poverty and hunger reduction crucially depends on the increased productivity and profitability of these farmers, which in turn depends on the successful delivery of agricultural extension.

Several emerging challenges confront Indian farmers. These include limited land and water availability, which is further exacerbated by degradation of natural resources; climate changes; changes in demand and consumption patterns, moving toward high-value agriculture; increasing population pressure; and liberalization of trade (Lele et al. 2010). Recent global food price increases and high levels of inflation have provided an opportunity to increase farmers' profitability. However, to realize the benefit of higher prices, farmers need to access a wider range of information, related not only to production technologies but also to postharvest processes, access to remunerative markets, price information, and business development (Sulaiman and van den Ban 2003). This information could be integrated with services that support the use of the information. For example, technology information needs to be supported with information about reliable sources for that technology, and where credit can be accessed. In India, the role of agricultural extension in improving agricultural growth is today being recognized with increasing investment. India's 10th and 11th five-year plans emphasize agricultural extension as a key to increasing agricultural growth by reducing the yield gap in farmer fields, and therefore stress the need to strengthen agricultural extension in India (Planning Commission 2001, 2005, 2006).

However, despite the renewed interest and investment in agricultural extension in India, the coverage of such services is inadequate. Government extension programs, extension services of the national agricultural research system, cooperatives, and nongovernmental extension programs have a very limited outreach (NSSO 2005). The 2003 National Sample Survey Organisation (NSSO) survey showed that 60 percent of farmers had not accessed any source of information on modern technology to assist in their farming practices in the past year. Of those who had sourced information, 16 percent received it from other progressive farmers, followed by input dealers. Of those farmers who had accessed information, the major problem of extension services was found to be the practical relevance of the advice (NSSO 2005). The coverage and relevance of information provided to farmers through the agricultural extension system is therefore questionable. While this may be partly due to inadequate contact by the services, which need to reach a large and complex farming community, inappropriate or poor-quality information could also be a key hindrance to farmers' use of extension services. In other words, the content of the information provided by agricultural extension approaches, and the information farmers actually need, may not be aligned. There is therefore a need to reexamine the current agricultural extension approaches in India to understand where information gaps exist and determine why farmers are not accessing information through the large, well-established public-sector extension system in addition to emerging private and third-sector actors.

Even with the poor climatic conditions and ineffective agricultural policies that have continued to prevail in sub-Saharan Africa, the introduction and use of participatory community development approaches and sustainable agriculture have not only empowered poor smallholder farmers but also increased food production and income. A detailed study of several projects in several countries shows that there has been a lot of success recorded with the use of both Participatory Community Development and Sustainable Agriculture in Sub-Saharan Africa, but there have also been problems, limitations and constraints (E. Mukhwana, 2003)

2.6 Farmers Field Day

Originally, the purpose of agricultural extension was to extend research findings beyond the walls of universities and research stations to farmers' fields (Rolling &Wagemakers, 1998)for effective technology adoption by farmers, the use of facilitative methods such as farmers' field days and small plot adoption (Amim, 2010).It is increasingly acknowledged that public extension services in developing countries are no longer able to meet the changing needs of farmers. As a result, the sector has over the last decade, been going through a transformative process from the linear model of technology transfer to the more pluralistic demand driven extension. Despite the transformation, extension in Africa is still faced with many challenges which have been accelerated by structural adjustment reforms aimed at reduced public spending. Some of the challenges include low budgetary allocation, understaffing and low staff morale due to poor remuneration (Kiptot et al. 2006)

The SG 2000 project in Ghana claimed the most success. The extensive coverage of on-farm demonstrations was undoubtedly a major factor in the wide adoption by Ghanaian farmers of maize seed-fertilizer technology. An even larger program in Ethiopia, initiated in the early 1990s under the Participatory Demonstration and Training Extension System, integrated extension with provision of seed, fertilizer and credit. Once scaled up, the program reached about 40 percent of the roughly 10 million farm households in Ethiopia over a 10-year period (3.6 million demonstrations in 1999 alone) and demonstrated that the adoption of seed–fertilizer technologies could more than double maize yields. Despite these efforts, adoption of maize technologies in Ethiopia is still low and a viable private sector input distribution system has yet to emerge (Spielman et al., 2010).

A case in point is the Farmer Field School (FFS) approach to knowledge Enhancement, which is gaining prominence in many developing countries. In recent years, a number of

development agencies, including the World Bank, have promoted FFS as a more effective approach to extend science-based knowledge and practices to farmers. Though pioneered and first promoted by the Food and Agriculture Organization (FAO) as a practical way of diffusing knowledge intensive integrated pest management (IPM) concepts and practices for East Asian rice-based systems (Kenmore, 1991; van de Fliert, 1993), the FFS has since evolved to include a broader coverage of other farm-relevant topics in its curriculum. The training program utilizes participatory methods "to help farmers develop their analytical skills, critical thinking, and creativity, and help them learn to make better decisions" (Kenmore, 1997). In this approach, the trainer is more of a facilitator, rather than an instructor, reflecting a paradigm shift in extension work (Roling and van de Fliert, 1994).

The typical FFS conveys to farmer participants knowledge on agro-ecosystems analysis, within a framework of integrated pest and crop management. A great emphasis of the program has been on sensible pest management, safety with regards to chemical pesticides, and understanding of the interactions between pest insects and beneficial insects that limit the numbers and the impact of pests. With the knowledge gained in the FFS training, it is expected that farmers would practice a lower and safer use of chemical pesticides. Participatory training and hands-on experimentation are a key principle of the FFS, and the purpose of the training is to make the graduates "confident pest experts

Although agricultural extension service is necessary to raise the awareness of farmers of existing and new technologies, it is not sufficient in itself to raise agricultural productivity due to many factors that influence productivity. Consequently; availability of working capital to the farmers to acquire adequate productivity enhancing inputs is of critical importance in strategies aimed at improving agricultural productivity. Rural financial services, therefore, are an important component in the set of services necessary for agricultural productivity

growth (Tegemeo Institute, 2008.). Farmers who accessed agricultural credit recorded higher level of maize productivity than those that did not (Kibaara, 2006).

Further to the cost-prohibitive technologies, the ToT's sole focus on transferring information to individual farmers dilutes the essential focus on issues beyond the individual level. These issues include underlying social factors impeding agricultural production that mainly include access to land, resources and power in decision making (Minnis, 2006; Leeuwis, 2004; March et al., 1999; Percy, 1999a). For example, access to markets requires collective action, given the smallholder dominance in SSA, (Leeuwis, 2004; Duveskog, 2006) and the conservation of natural resources including soil and natural predators due to their ecological characteristics inherently require collective action (Tyler, 2006; Fliert et al, 2007). Additionally, the ToT approach is limited in its emancipatory potential in addressing other societal factors such as gendered powered relations. Indeed, evaluations of ample development programs using the ToT approach reported gendered power relations, especially the lack of power for women in decision making, as a hindering factor to adopting more productive agricultural technologies (March et al., 1999; Newmark, 2002). (Berg and Jiggins',2007) study on Farmer Field Schools (FFS) revealed that, in contrast to individual farmer extension learning setting, the farmer field school setting a collective learning setting resulted in action in the social and political realm, where farmers practiced farmer-to-farmer extension, in context of limited extension staff, and had a stronger access to markets. Hence, the blanket application of the ToT package with its focus on individual farmers seems to be of little benefit to these diverse and smallholder dominant areas (Rolling, 2005).

Cereal stem borer and striga weed are amajor challenge to sustainable maize production in some parts of Kenya accounting for 80 % and up to 100 % maize yield losses respectively especially under severe infestation (Khan et al 2001). The losses translate to an annual cash

income loss of up to $ 40.8 million and presents great risk of food insecurity and poverty to the affected families (Khan et al. 2008; Midega et al., 2010). In response to these challenges, the International Centre of Insect Physiology and Ecology (ICIPE) in collaboration with other research organizations developed a habitat management strategy for controlling the stemborers and Strigasimultaneously. This control strategy termed the 'push pull' technology (PPT) is based on stimulo-deterrent strategy where companion crops release behaviour modifying stimuli that manipulate the distribution and abundance of pests and/or beneficial insects for management of the pests (Cook et al. 2007; Khan et al. 2008; Midega et al., 2010). The technology is currently being practiced by about 25,000 smallholder farmers in East Africa and is being promoted through various dissemination pathways to improve output in cereal production while minimizing negative environmental effects (Khan et al. 2008; Amudavi et al. 2008, 2009).Since PPT is knowledge-intensive the potential for uptake would be limited especially among the smallholder farmers if appropriate dissemination pathways are not used to ensure its effective transfer. It has been shown that farmers preferences for dissemination pathways do exist and that the choice of dissemination pathway should not only be based on their effectiveness and capacity to reach larger number of farmers, but also according to their perceived credibility, relevance and preference among target audience (Gloy et al. 2000; Roderick et al. 2008). Rogers (1995) acknowledge that farmers are likely to be persuaded to adopt a technology by information pathways that they perceive as credible and reliable.

(UNDP,1991). Noted that reexamination of the conventional view on agricultural knowledge cannot, however, result in questioning the important role of research as the source of new technology. For developing countries, one observes that the accelerated growth and spread of problems such as the degradation of marginal land surpass the problem-solving capacities of

the local population. What is called for is a setting of new priorities and the building of knowledge systems based on problem solving rather than on information transfer.

2.7Theoretical Framework

This research is based on subsidy theory and an agricultural subsidy is a governmental subsidy paid to farmers and agribusinesses to supplement their income, manage the supply of agricultural commodities, and influence the cost and supply of such commodities. A ``subsidy'' is a collective term that covers a broad range of governmental economic interventions and policies. These economic interventions are issued to beneficiaries by the government in many forms including but not limited to market access, domestic support and export subsidies (Portugal, 2002). A Subsidy is a benefit given by the government to groups or individuals usually in the form of a cash payment or tax reduction

The subsidy is usually given to remove some type of burden and is often considered to be in the interest of the public.(www.investopedia.com/terms/s/subsidy.asp).In 2010, the EU spent €57 billion on agricultural development, of which €39 billion was spent on direct subsidies (en.wikipedia.org/wiki/Agriculturalsubsidy).In this world, subsidies are a form of market distortion which leads to a misallocation of resources and a reduction in social welfare (Amegashie 2006). There is a Keynesian view of macroeconomic policy management where subsidies could be used to boost expenditure or aggregate demand. Hence, the removal of subsidies might dampen economic activity. But this depends on one's view of the budget balance. If we appreciate the fact that subsidies must be financed through taxation, then the removal of subsidies might also imply the reduction of taxes. The reduction of taxes could stimulate the economy. In reality, taxes are not reduced when subsidies are removed nor is there necessarily a strong connection between subsidies and taxes (Amegashie, 2006).

In the US, agricultural subsidies began in the year 1933, when average farm income was 32% of the averageon-farm income (Gardener 1992).this aimed to give agriculture a fair share of national income. By 1973 farm and non-farm income had essentially converged (Nourse et al 1937)In the 21st century, subsidized American farmers have gleaned on average $ 8824 annually in subsidy payments making agricultural subsidies one of the largest per capita transfer programs in the US. Although originally motivated by equity concerns, farm subsidies are today considered as entitlements (Kirwan, 2009).

The removal of subsidies on agriculture, health, education, petroleum products, etc is one of the key policy prescriptions by the World Bank to developing countries. Presumably, this policy is supposed to enhance economic performance in these countries. However, the removal of subsidies can have adverse effects on the poor in these countries and lead to political agitation as evidenced in the 2005 demonstrations after the ruling NPP government in Ghana removed the subsidy on petrol (Amegashie, 2006)

The smart input subsidies should target farmers who cannot afford fertilizer purchases in order to avoid displacement of commercial fertilizer sales. Second, the subsidy should be linked with the best possible research and extension advice in order to be sure that farmers get the highest possible gains from this investment. The fertilizers being provided need to be targeted to variable soil and rainfall condition around the country. These should be linked with advice on cropping practices that will improve both fertilizer and water use efficiency such as timely application, good weed control and conservation farming practices. Third, the subsidy should be managed in ways that encourage the expansion of commercial investment in wholesale and retail trade in agricultural inputs. This should be a gain partly made by shifting from free input handouts to the use of vouchers redeemable at retail shops. But retail trade would need to be expanded in many outlying areas (Byerlee, 2008).

Over time, commercializing farmers should no longer need subsidies to encourage the continuing adoption of improved technologies and farm profitability. Though there may be a continuing justification for input subsidies to improve the welfare of the poorest of the poor who would otherwise continue to depend on food aid. Smart subsidies are important but need to be weighed against other priorities in national budgets (Byerlee, 2008)

2.8Conceptual Framework

The conceptual framework shown in figure 2.1 below indicates the relationship between the dependent variable which is maize production in Nyamarambe division and independent variables which areProvision of free farm inputs to farmers, farmer groups trainings, farm follow up visits, and holding of farmers field day in the NAAIAP program implementation.

The framework also shows the relationship between the intervening and moderating variables with the independent and dependent variables.

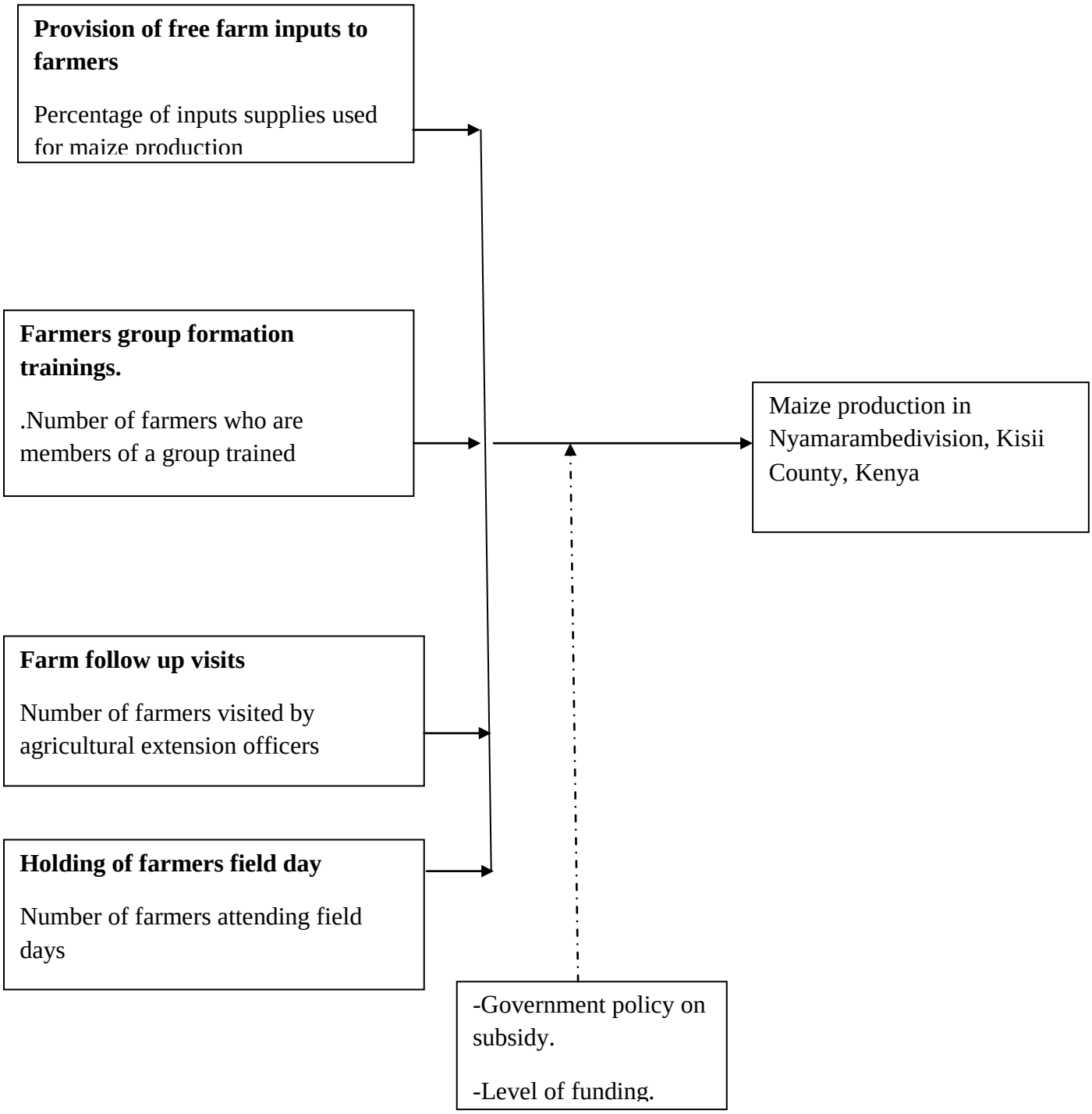

Figure one; conceptual framework

2.9 Chapter summary

The literature review has reviewed literature on the concept of NAAIAP implementation, Provision of free farm inputs to farmers, Farmer group trainings, farm follow up visits andholding of field days in the NAAIAP program implementation. The chapter also reviewed literature on subsidy theory which is the theory that this research is based on. The relationship between the dependent and independent variables has been illustrated by the researcher in the conceptual framework figure one.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

Research methodology may be understood as a science of studying how research is done scientifically (Kothari, 2004). In this chapter the researcher describes the basic research plan and gives an insight on the research procedures, the different steps that were adopted in the study of the research problem, plus the logic behind the steps being studied. The sub-sections below are geared towards describing the research design, target population, sample selection and size, research instruments, validity and reliability of the research instruments, data collection procedures and data analysis technique.

3.2Research Design

A research design is made up of decisions concerning what, where, when, how much, by what means with regard to a research study (Kothari, 2004). The researcher used a descriptive research design.Kothari (2004) defines descriptive research design as that study concerned with describing the characteristics of a particular individual, or of a group.

The researcher undertook a descriptive survey in the conduct of this research. Descriptive survey is a method of collecting information by interviewing or administering questionnaire to a sample of individuals (Orodho 2003). The survey research design entailed investigating populations by selecting samples to analyze and discover occurrences. It also enabled the researcher to provide qualitative and numeric descriptions of the sample from a given population. The researchers choose on this design since it will show the relationship between variables and the research population is semiliterate. The descriptive research design provided also both qualitative and quantitative data cost effectively.

3.3 Target Population

A population is an entire group or complete set of individuals, events, cases or objects with some common observable characteristics (Mugenda&Mugenda, 1999). The target populations for this research werethe program beneficiaries in Nyamarambe division. The NAAIAP program beneficiaries are one thousand two hundred farmers in Nyamarambe division and thus this represent the research population.

3.4 Sample Size and Sampling Procedure

Sample is a finite part of a statistical population whose properties are to gain information about the whole (Webster, 1985). A sample of 10%- 20% is acceptable (Airy et al 1972). The researcher is going to use a sample size of 10% of the program beneficiaries.A total of one hundredand twenty beneficiaries from the two locations will be sampled as shown in the table below.

Location	Number of Program beneficiaries(Population)	Program beneficiaries included in the Sample selected (10%)
Nyakemene	600	60
South MugirangoChache	600	60
Total	1200	120

Table 3.1 sample selection

3.4.1 Sample Selection

The researcher employed a random sampling on the targeted beneficiaries which are 1200 in number and this represent 100% of the population. The researcher selected 10% of the target population as illustrated in figure 3.1 and this were a representative sample of the population. Random sampling was used to select 120 respondents for this research. The names of all the one thousand two hundred beneficiaries as provided by the ministry of agriculture were arranged in alphabetical order and numbered from one to one thousand two hundred and every tenth beneficiary sampled.

3.5Research Instruments

The research instrument used in this study is a questionnaire. The instrument was designed by the researcher in such a way that it adequately captures data that addresses the four objectives. According to Khan (2008) a questionnaire guide allows a researcher to collect data from respondents with low literacy levels; collect information that cannot be directly observed, obtain historical information and gain control over the line of questioning. Thus a questionnaire was administered to all the 120 respondents to obtain the required information.

3.5.1 Piloting of the Study

The study instrument was piloted in Nyakembene location of Nyamarambe division using twenty selected beneficiaries who was selected using purposive sampling for the questionnaire. This was essential in determining the reliability and validity of data collection instrument.

3.5.2 Instrument Validity

The questionnaire was pre- tested to twenty selected farmers similar to the actual sample to be used and the responses generated were analyzed by the researcher and the content validity

was ensured as it generated the required information. The supervisor also went through the questionnaire in determining its suitability and assured of construct validity.

3.5.3Instrument Reliability

Kothari (2004), reliability is a measure of the degree to which research instruments yields consistent results or data after repeated trials. According to Mulusa, 1990 an instrument is consistent when it produces the expected results. Thus, the research instrument waspretested in Nyakembene division using test retest method. The response from each category of twenty randomly selected farmers was scored. One week later the same instruments was administered in the same area to the same respondents. Their responses will again be scored. Using Pearson Product Moment Correlation Method, a coefficient of correlation factor wasbecalculated for the instrument at 1% degrees of confidence between the first and second scores. A coefficient of correlation factor of O.75 were obtained and this represented a high positive correlation and it proved that the instrument were valid.

Frankel &Wallen (2000) noted that a coefficient of 0.7 provides a minimum threshold to confirm the reliability of a research instrument.

3.6 Data Collection procedures

The researcher proceeded to seek permission for data collection from the District agriculture officer Gucha south district. This was be supported by the letter from the Department of Extra Mural Studies, University of Nairobi. The next step was to train research assistants on the use of research instruments, administration and interview conduct through a mock exercise on the use of instruments. The final step was the research assistants proceeding to the field for data collection with close supervision to ensure that the process goes on as planned.

3.7Data Analysis

Analysis refers to the computation of certain measures along with searching for patterns of relationship that exist among data groups (C.R.Kothari, 2004).The researcher used descriptive statistics to analyze the relationship between variables using data from the questionnaire quantitatively using themes from the subject responses and converting them into frequency counts as percentages (%) and tables.The collected data was coded, entered and analyzed using the Statistical Package for Social Sciences Version 19.0 Computer Software. Data analysis outputs included descriptive statistics, means, frequencies and percentages. Frequency distribution tables were also used to allow the researcher to present visual and accurate reflections on data variations. Measures of central tendency and measures of dispersion was also be used in the analysis.The researcher also used inferential statistics which will include correlation analysis to determine the relationship between different variables.

3.8 Ethical Consideration

The research is purely for academic purposes and confidentiality of the respondents shall be kept. Anonymity of the respondents will also be ensured.

3.9 Operationalization of Variables Table

S/No	**Objectives**	**Type of variable**	**Indicators**	**Measurement Scale**	**Data Collection tool**	**Data Analysis tools**
1	To determine how provision of free farm inputs influence maize production in Nyamarambe division, Kisii county Kenya.	**Dependent variable** Maize production **Independent Variable** Provision of free farm inputs	Percentage change in maize yield. Amount of input received. Percentage of inputs used for maize production	Ordinal	Questionnaire	Descriptive statistics
2	To establish the extent to which farmer group training influence maize production in Nyamarambe division, Kisii county Kenya.	**Independent Variable** Farmer group formation, and training	Number of farmers who are members of NAAIAP farmer groups. Number of farmers attending trainings.	Ordinal	Questionnaire	Descriptive statistics
3	To examine how farm follow up visits influence maize production in Nyamarambe division, Kisii county Kenya.	**Independent variable** Farm follow up visits	Number of farm follow up visits made.	Ordinal	Questionnaire	Descriptive statistics
4	To assess how holding of farmers field days influence maize production in Nyamarambe division, Kisii county Kenya.	**Independent variable** Holding of farmers field days	Number of farmer's field days held. Number of farmers attending the field day.	Ordinal	Questionnaire	Descriptive statistics

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This study sought to understand the influence of national accelerated agricultural inputs access program (NAAIAP) on maize production in Nyamarambe division, Kisii County, Kenya. The government of Kenya in an effort to address food security challenges through the development of maize value chain aimed at improving maize production designed the NAAIAP program. The key NAAIAP program activities are provision of free farm inputs in form of maize seeds and fertilizer, farmer trainings on maize production, holding of farmers field days and farm follow up visits by agricultural extension staff. The chapter is arranged starting with the questionnaire return rate, results and interpretation.

4.2 Questionnaire Return Rate

A total of 120 questionnaires were administered using a random sampling technique. The names of all the one thousand two hundred beneficiaries as provided by the ministry of agriculture were arranged in alphabetical order and numbered from one to one thousand two hundred and every tenth beneficiary sampled. The questionnaire return rate was 100% because they were administered by the researcher with the assistance of two enumerators.

4.3 Demographic Characteristics of Respondents

The response on gender composition and age of the respondents are presented in below table 4.1 and table 4.2.

4.3.1 Composition of Respondents by Sex

Response	Frequency	Percent
Female	46	38.3
Male	74	61.7
Total	**120**	**100.0**

Table 4.1 Respondent gender frequency table

The research showed that 61.7% of those interviewed were men and 38.3 % were women. This shows that there were more men program beneficiaries than women beneficiaries

4.3.2 Level of Education of Respondent

Level of education	Frequency	Percent
No formal education	23	19.2
Primary	62	51.7
Secondary	26	21.7
Tertiary	9	7.5
Total	**120**	**100.0**

Table 4.2 level of Education frequency table

Majority of the respondents said that they completed at least primary school level of education at 51.7 %. This shows us that most of the respondents are semi-literate and were able to follow up on the trainings and atleast implement the technology they have leant thus resulting in increased maize production.

4.4 Influence of Free Farm inputs on Maize Production

Farm input received response	Frequency	Percent
Yes	**120**	**100.0**

Table 4.3 Receipt of farm inputs table

From the list provided by the ministry of agriculture where this research drew it sample from, all the respondents admitted that they received the farm inputs. This shows us that the government assistance reached the target beneficiaries.

Increased maize production in 90 kg bags	Frequency	Percent
.00	17	14.2
.25	1	.8
1.00	12	10.0
1.20	1	.8
2.00	6	5.0
3.00	15	12.5
3.80	1	.8
4.00	7	5.8
5.00	10	8.3
6.00	12	10.0
7.00	10	8.3
8.00	6	5.0
9.00	11	9.2
11.00	3	2.5
12.00	3	2.5
13.00	4	3.3
14.00	1	.8
Total	**120**	**100.0**

Table 4.4 Increase in maize production frequency table

These research shows that only 14.2 % of the program beneficiaries did not record increased maize production. This research shows that thou the NAAIAP program registered success in increasing maize production there are those special needs category of people who require more follow ups and additional assistance such as provision of labour.

4.5 Farmer Group Training on Increased Maize Production

Response	Frequency	Percent
No	42	35.0
Yes	78	65.0
Total	**120**	**100.0**

Table 4.5Attendance to farmer training frequency table

The research revealed that 65 % of farmers said that they attended trainings organized by the program and 35% did not attend. This shows that majority of these farmers were attending these program training.

4.6 Influence of Farm Follow Up Visits on Maize Production

This analysis aimed at understanding the frequency of farmers whose farms were visited during program implementation and whether they implemented the advice given. It also aims at analysis the relationship between farm follow up visits and maize production

Number of visits	Frequency	Percent
.00	70	58.3
1.00	20	16.7
2.00	11	9.2
3.00	9	7.5
4.00	7	5.8
5.00	3	2.5
Total	**120**	**100.0**

Table 4.6; Farm follow up visits frequency table

The above table 4.8 shows us that 58.3% of the respondents were not visited for on farm support visit.16.7% of the respondents were visited once,9.2% were visited twice, 7.5 % were visited three times,5.8% were visited four times and 2.5% visited five times. The interpretation of this is that the ministry of agriculture has a lean staff thus it becomes impossible to visit all farms.

Correlation analysis		Farm follow up visits	Increased production in 90 kg bags
Farm follow up visits	Pearson Correlation	1	.775**
	Sig. (2-tailed)		.000
	N	120	120
Increased production in 90 kg bags	Pearson Correlation	.775**	1
	Sig. (2-tailed)	.000	
	N	**120**	**120**

Table 4.7 Influence of farm follow up visits on maize production

There is a strong positive correlation of 0.775 on the influence of farm follow up visits on maize production. The research shows that those farmers whose farms were visited registered higher levels of increased maize production.

4.7 Influence of Field Days on Maize Production

Response	Frequency	Percent
No	26	21.7
Yes	94	78.3
Total	**120**	**100.0**

Table 4.8 Attendance to field days frequency table

The research shows that 78.3 percent of respondents attended field days while 21.7 of them did not attend the field days. This compared to 14.2 of respondents who did not register any increase in maize production shows us that the field days contributed to increased maize production.

CHAPTER FIVE

SUMMARY OF FINDINGS, DISCUSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The purpose of this study is to understand the influence of national accelerated agricultural inputs access program (NAAIAP) on maize production in Nyamarambe division, Kisii County, Kenya. Section 5.2 of this chapter provides a summary of the study findings, section 5.3 deals with discussions 5.4 gives the conclusions, 5.5 gives recommendations based on the findings from the study, section 5.6 gives the contribution to knowledge, and lastly section 5.7 outlines some suggestions for further research.

5.2 Summary of Findings

The results of this study show that NAAIAP program influence maize production significantly. The provision of free farm inputs to the farmers led to increased maize production. Farmer trainings also led to increased maize production in Nyamarambe, Farm follow up visits also contributed to increased maize production in Nyamarambe division KisiiCounty, Kenya, The study also reveals that holding of farmer's field days significantly influenced maize production.

5.3 Discussions

IFDC 2009-2010, annual report observed that in Africa, since the inception of the Catalyze Accelerated Agricultural Intensification for Social and Environmental Stability (CATALIST) project in Burundi, the Democratic Republic of Congo and Rwanda, over 50% of farmers exposed to participatory tests have adopted one or more agricultural technologies. This research also concluded since the NAAIAP program intervention, the respondents'interviewed said that they have gained from field day demonstration plots, farm

follow up visits and farmer trainings and have adopted good agronomic practices which led to increased maize production in Nyamarambe division.

(Spring, 2000) observed that although the use of improved maize seed can be a catalyst for increasing farmers use of other inputs, and especially fertilizer, such broad-based change has only occurred in some parts of Sub-Saharan Africa. Most farmers do not adopt the additional production practices needed to sustain yield improvement. This observation is in line with the findings of this research as it shows that provision of high quality inputs alone is not enough to sustain increased production. Additional capacity building is needed to enhance the farmer's ability to increase production.

Agricultural inputs, primarily seed, fertilizer and agrochemicals, have an enormous potential to leverage the efforts of hard-working farmers. Used appropriately, they can mean the difference between a good harvest and starvation (Negeri and Adisu, 2001). This research is in agreement with this statement as it found out that hardworking farmers especially the youth and middle age registered the highest levels of increased maize production. This research shows that only 14.2 % of the respondents did not register increased production while the remaining 85.8% recorded increased production at various levels.

(Shepherd, 2000) identified marketing to be farmers` frequent major problem. These research discovered that there marketing is not necessarily the greater challenge since these farmers hardly produce enough to eat thus have no surplus to market. The major problem is thus increasing production in a sustainable.

The combination of agricultural extension with hardware assistance to farmers in form of seeds and equipment that aid production has proven to yield great output. In this research, the distribution of farm inputs which is hardware assistance and subsequent farmer trainings, farm follow ups which are considered software resulted in increased maize production. This

is concurrent with what (Muyanga et al, 2006) postulated thatExtension systems and input distribution systems are, therefore, mutually reinforcing in their contribution to agricultural productivity.

5.4 Conclusions

This study concludes that distribution of free farm inputs by NAAIAP program led to increase in maize production.This study also showed that farmers after receiving the farm inputs from the program which were to be used entirely to produce maize were faced with competing interests. Most farmers used part of the fertilizer to grow other crops instead of using it for maize production in totality. These reduced the output of the program.Crops competing with maize were sorghum, finger millet and vegetables.

This study also reveals that farmer group training led to an increase maize production. It reveals that farmers who attended farmer training recorded highest increase in production compared to farmers who did not attend the trainings.

This study concludes that farm follow up visits by agricultural extension staff led to increased maize production in Nyamarambe division. The production challenges that were observed on the farm were addressed and the farmers given advice which they subsequently implemented thus leading to increased maize production.

The study also concludes that holding of farmer field days led to increased maize production. Fielddays also exposed farmers to participatory on farm trials that's the technology retention rates were high and atleast most farmers implemented what they learnt during the fielddays.

5.5 Recommendations

From the findings of this study the following recommendations are made:

i. The farm inputs supplied should be of good quality especially the seed maize. The seed maize to be given to farmers should be the recommended type for that agro ecological zone.

ii. The program should consider employing private extension service providers to bridge the shortfall in government extension service providers who are very thin in the ground. This will ensure that more farmers get service.

iii. Continued mentorship and capacity building of community leaders to become trainer of trainees so as to compliment government extension staff should be adopted by the program to ensure that the farmers get services within the community

iv. More youth should be considered in the program in future since they showed more commitment in attending trainings and also posted great increase in maize production.

v. Support on farm supervisions should be encouraged as it targets individual farmer and the advice given is personalized thus higher chances of being implemented.

vi. Field days should be increased in number and more publicity and public awareness created to farmers on when it will be done and what will be on the exhibition stands so that more farmers can attend and learn.

5.6 Contribution to Knowledge

This study will be useful to program coordinating unit by providing key findings and recommendation which can be incorporated into future programing strategies.

This study will also be insightful to government employees, policy maker's non-governmental organization while planning and implementing of agricultural programs.

This study will also be informative to farmers on the factors that contribute to enhanced agricultural production such as attending fielddays and trainings and subsequent implementation of what is recommended.

5.7 Suggestions for Further Research

A study to be undertaken to determine the influence of free farm inputs supplied to farmers on local seed stockiest businesses

A study to be undertaken on the effectiveness of farmer field schools in enhancing agricultural production

A study to be undertaken to determine the role of farmer to farmer extension services in complimenting government extension services

A study to be undertaken on the contribution of field days on participatory on farm demonstration plots in disseminating agricultural technology

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APPENDICES

APPENDIX ONE; LETTER OF TRANSMITTAL

University of Nairobi,
School of Continuing and Distance Education,
P. O. Box 30197,
NAIROBI
30 TH September 2012

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

Re: Letter of Transmittal

This is to request you to respond to this questionnaire .The study is being conducted solely for purposes of research in establishing **the influence of national accelerated agricultural inputs access program on maize production in Nyamarambe division, Kisii County, Kenya.** This study may help the staff implementing the project in Nyamarambe division to know the influence of NAAIAP on maize production and subsequently reinforce what is working well and devise copping strategies on those activities not working well. The study will also inform the agricultural stakeholders on the output of various intervention measures on maize production. This study may also assist the government in the evaluation of results of NAAIAP.This research is being conducted by the undersigned in partial fulfillment of the requirement for the award of a degree of Master of Arts in Project Planning and Management of the University of Nairobi. The information obtained shall be treated as confidential.

Thanking for your cooperation.

Yours faithfully,

Robert Bett

APPENDIX TWO; QUESTIONNAIRE

'**Nyamarambe division national accelerated agricultural inputs access program (NAAIAP) beneficiary questionnaire'**

This questionnaire is aimed at gathering data on influence of national accelerated agricultural inputs access program on maize production in Nyamarambe division, KisiiCounty, Kenya. Your response will be important for the researcher in this academic study.

Questionnaire reference number……..

PART A

1. Demographic information of the réspondent

Location …….

Age ……

Sex…….(a) Male ☐ (b) Female ☐

2. . Level of education of the respondent

Primary ☐

Secondary ☐

Tertiary ☐

N/A ☐

PART B:

Objective1. Provision of free farm inputs

Please answer the questions below by ticking in the boxes.

3. Did you use the inputs received from the ministry of agriculture for maize production

(a)Yes ☐ (b) No ☐

4. If your answer is yes what percentage of the inputs did you use for maize production.

(a) 0 to 25% ☐

(b) 26 to 50% ☐

(c) 51 to 75% ☐

(d) 76 to 100% ☐

5. Which other crops was the fertilizer provided used to grow?

……

……

6. Did you register increased maize harvest as a result of using the inputs?

Yes ☐ (b) No ☐ (c) Do not know ☐

7. If yes above what was the increase in yield in 90 kilograms bags?

(a) 0.1 to 5.0 ☐

(b) 5.1 to 10.0 ☐

(c) 10.1 to 15.0 ☐

(d) Over 15.1 ☐

Objective;2 Farmergroup trainings

8. Are you a member of a NAAIAP farmer group?

(a)Yes ☐ (b) No ☐ (c) Do not know ☐

9. Is your group registered with the ministry of social services?

a)Yes ☐ (b) No ☐ (c) Do not know ☐

10. Have your group received any trainings sponsored by NAAIAP?

(a)Yes ☐ (b) No ☐ (c)Do not know ☐

11. Do you Agree that NAAIAP beneficiary group trainings has led to increased maize production?

1. Strongly agree 2. Agree 3. Disagree 4. Strongly disagree 5. Neutral

Objective 3: Farm followup visits

12. Have your farm been visited by the ministry of agriculture extension staff?

Yes ☐ (b) No ☐ (c) Do not know ☐

13. If yes, how many farm visits have they made to your farm for NAAIAP program?

Once ☐

Twice ☐

Three times ☐

Four times ☐

Five and above ☐

14. Do you agree that farm follow up visits by NAAIAP led to increased maize production? (Tick one)

1. Strongly agree 2. Agree 3. Disagree

4. Strongly disagree 5. Neutral

Objective 4: Holding of farmers' field day

15. Have you ever attended any field day organized by NAAIAP?

Yes (b) No (c) Do not know

16. If yes, how many times have you attended a NAAIAP field day?

Once ☐

Twice ☐

Three times ☐

Four times ☐

Five and above ☐

17. Do you agree that the field days you attended led to increased maize production?

1. Strongly agree 2. Agree 3. Disagree 4. Strongly disagree 5. Neutral